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Research Article

Aloe vera Gel: Effective Therapeutic Agent against Multidrug-Resistant *Pseudomonas aeruginosa* Isolates Recovered from Burn Wound Infections

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Objective. *Aloe vera* is an herbal medicinal plant with biological activities, such as antimicrobial, anticancer, anti-inflammatory, and antidiabetic ones, and immunomodulatory properties. The purpose of this study was investigation of *in vitro* antimicrobial activity of *A. vera* gel against multidrug-resistant (MDR) *Pseudomonas aeruginosa* isolated from patients with burn wound infections. *Methods*. During a 6-month study, 140 clinical isolates of *P. aeruginosa* were collected from patients admitted to the burn wards of a hospital in Tehran, Iran. Antimicrobial susceptibility test was carried out against the pathogens using the *A. vera* gel and antibiotics (imipenem, gentamicin, and ciprofloxacin). *Results*. The antibiogram revealed that 47 (33.6%) of all isolates were MDR *P. aeruginosa*. The extract isolated from *A. vera* has antibacterial activity against all of isolates. Also, 42 (89.4%) isolates were inhibited by *A. vera* gel extract at minimum inhibitory concentration (MIC) ≤ 200 μg/mL. MIC value of *A. vera* gel for other isolates (10.6%) was 800 μg/mL. All of MDR *P. aeruginosa* strains were inhibited by *A. vera* at similar MIC_{50} and MIC_{90} 200 μg/mL. *Conclusion*. Based on our results, *A. vera* gel at various concentrations can be used as an effective antibacterial agent in order to prevent wound infection caused by *P. aeruginosa*.

1. Introduction

Pseudomonas aeruginosa (*P. aeruginosa*) is increasingly recognized as one of the important nosocomial pathogens leading to severe infections especially in hospitalized patients in burn wards [1]. This opportunistic and highly resistant pathogen is responsible for a variety of nosocomial infections, including urinary or wound infections, bacteremia, endocarditis, and in some conditions death. *P. aeruginosa* infections in immunocompromised, debilitated patients, cystic fibrosis, and hospitalized burn patients are associated with increased rates of mortality and morbidity [1, 2]. The unselective and extensive use of antibiotics is highly considered as the major cause of invasive procedures. Accordingly, development of resistance mechanisms either intrinsic or acquired has promoted the rapid development of multiple resistances among *P. aeruginosa* isolates in the clinical settings [2]. The rapid increase of drug resistance in clinical isolates of *P. aeruginosa* is a growing concern among hospitalized patients [3, 4]. During the past several decades, several different epidemiological studies indicated that multiple resistances among *P. aeruginosa* clinical isolates are increasing [5]. The widespread multidrug-resistant (MDR) *P. aeruginosa* strains not only lead to increased economic